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Surgeons General of the Past

(The twenty-fifth in a series of brief biographies)



Herbert Lamont Pugh was born in Batesville, Virginia on 5 February 1895. He attended the University of Virginia, and after service with the Marine Corps in France during World War I, he received his medical degree from that university in 1923. He was commissioned Lieutenant (jg) in the Navy's Medical Corps 15 June 1923, and completed his graduate internship at the Chelsea Naval Hospital. He progressed through the various grades to Captain on 20 June 1942 and to Rear Admiral on his appointment as Deputy Surgeon General of the Navy 2 December 1946. His chief assignments at sea included duty aboard the *California*, *Asheville*, *Rochester* and *Gold Star*; and ashore he was Assistant Chief of Surgery at the naval hospitals in Great Lakes, Annapolis, Philadelphia, Washington and Bethesda. Doctor Pugh was Chief of Surgery at the Guam Naval Hospital, Mobile Base Hospital No. 1 in Cuba, and at the naval hospitals in Pearl Harbor, San Diego and Bethesda. From December 1944 to December 1946 he was Commanding Officer of the Naval Medical School. Rear Admiral Pugh became Surgeon General of the Navy 27 January 1951 and served a 4-year term. Following this he was Inspector General, Medical and Commanding Officer of the National Naval Medical Center, and thereafter completed a History of the Medical Department for the period 1945-1955. He retired from active service 1 August 1956. On 1 October 1956 he was appointed Resident Physician of the George Washington University and still holds that position. Rear Admiral Pugh's chief interest and professional work were in the fields of surgery and preventive medicine. He authored an autobiography, *Navy Surgeon* in 1959, and over a period of 35 years wrote almost 70 professional articles for scientific journals.

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PEPTIC ULCER IN ADOLESCENTS AND YOUNG ADULTS: A REVIEW OF EXPERIENCE IN AN ARMY GENERAL HOSPITAL

LTCOL Ralph F. Wells MC USA, *Milit Med* 132(9):680-682, September 1967.

In an earlier volume of *Military Medicine*, Colonel Eddy Palmer listed a few of the difficulties faced by the military physician in coming to grips with the ulcer problem. His comments, like those of others, applied chiefly to active duty personnel with several years service. An additional group of ulcer patients seen frequently by the service physician must not be overlooked. This is a heterogenous lot consisting of dependent children reared in a "para-military" environment and young soldiers, especially recruits, who have in common an ulcer or ulcer diathesis which may have begun in childhood or adolescence. Experience with several teenagers who had significant complications of ulcer disease prompted this report. The feeling that such a study would be useful was reinforced when a literature review revealed a gap between studies of ulcer in childhood, with a cut-off at 15 or 16 years, and the more numerous studies in adults. Three pertinent observations emerged from this review: the relatively high rate of complication, the striking pattern of familial occurrence, and the need for careful pre-induction screening. The only recent paper which deals directly with ulcer in adolescents appeared in the German literature and is cited by Kirsner. Increasing military manpower needs also make critical analysis of this subject timely.

Observations

This paper is a retrospective study summarizing the experience of the Gastroenterology Service at William Beaumont General Hospital and does not reflect the total experience in that institution. The patients were referred either for medical consultation, administrative evaluation regarding profiling or retention or, in a few instances, simply because the referring physician was aware of the author's interest in the subject.

From January 1962 to June 1966, 36 patients ranging in age from 15 to 21 years of age were seen. Of the total patient group 30 were male and 6 female.

TABLE I
COMPLICATIONS

	Number	Transfused	Surgery
Hemorrhage	14	5*	3
Perforation	3		3
Obstruction	2		1

* Transfusion requirements 1500-7000 cc's.

Nineteen of the 36 patients (52.7 percent) developed a major complication. These are enumerated in Table I. The most frequently encountered problem was gastrointestinal hemorrhage which occurred in 14 patients. Five were transfused, and three required surgery. Three perforations occurred and all were treated surgically. Two patients developed obstruction. One of these was operated upon after three recurrences in 18 months. Only one death occurred in this series. This patient, a 20-year-old male, developed peritonitis following perforation of a gastric ulcer while on steroids for fulminant ulcerative colitis.

Although not a generally accepted "complication," the number of hospitalizations is noteworthy. There was a total of 56 hospitalizations in these 36 patients. Only two were not hospitalized. Valid figures for duration of hospitalization on purely medical grounds are not available due to the often protracted period required for administrative processing. Hospital stay ranged from 3 to 37 days, with an average of slightly over 14 days. This figure excludes one man who was medically separated from the service because of severe dumping as a consequence of emergency subtotal gastrectomy for massive hemorrhage (7000 cc's). In addition, 9 of 28 active duty personnel were medically separated for ulcer disease which had existed prior to induction into the service. The interval from induction until coming to medical attention varied from one day to two months. One of these patients had pyloric obstruction.

TABLE II
FAMILY HISTORY

	Age (Years)	Sex	Relatives with disease
1.	15	F	Father DU*; brother age 7 DU
2.	18	M	Father DU, ASHD**
3.	16	F	Father DU
4.	19	M	Father DU
5.	15	F	Mother DU
6.	21	M	Father DU
7.	20	M	Father DU

* duodenal ulcer

** arteriosclerotic heart disease

tion at the time of induction, one bled two weeks after induction, and a third perforated on his 60th day of duty.

A family history of ulcer was elicited in seven of 36 patients. The mother of one additional patient was thought to have a gastric ulcer but later proved to have a gastric carcinoma. No attempt was made to assess ABO status or other genetic factors. Although the number of patients studied is small, it would appear that if a parent had ulcer, children of the same and opposite sex had ulcer with nearly equal frequency. A detailed social history was recorded and a background of a stressful, often chaotic, home situation was frequently elicited. These situational problems were usually "domestic" in character rather than related to military factors such as forced separations or reassignment of a sponsor. Table II tabulates the family patterns.

In summary, the present series parallels earlier reports on younger patients in regard to sex distribution, complication rate, ulcer location, and family history. Uniform data regarding predisposing factors were not available.

Discussion

It is generally accepted that peptic ulcer is a common disease in young adults. The average age of onset for duodenal ulcer lies between 29 and 33, and for gastric ulcer between 38 and 41. F. Avery-Jones is quoted as reporting a peak incidence of ulcer in males in the decade from 45 to 54 (9.6 percent). Within the past few years peptic ulcer in children has been the subject of much interest because of an apparent increase in frequency and because of the relation to chronic adult peptic ulcer disease.

As many as 30 to 50 percent of childhood ulcers may persist into adult life; conversely, at least two

percent of adult ulcers stem from childhood ulcer. Singleton and Faykus retrospectively surveyed 29 hospitals in the United States and Canada and found an average of 1.9 new childhood ulcers reported yearly from each institution. Their own figures at Texas Children's Hospital are 0.6 new cases per year, a figure that has not varied for some time. The present series cannot answer the question of whether or not ulcer is actually increasing in this age group. Tudor has established a pediatric ulcer registry in order to evaluate this problem more thoroughly.*

A few comments regarding the clinical picture seem warranted based on the present series and the papers cited above. A clear-cut predisposing cause rarely exists outside the newborn period or infancy. Exceptions are those patients receiving salicylates, steroids, or those with central nervous system lesions or burns. Symptoms form a spectrum being atypical in early childhood but conforming to adult patterns by 8 or 10 years of age. The present series demonstrates the frequency with which complications may supervene.

The present study does little to delineate the mechanism of family ulcer, although familial occurrence is well documented. This has been the experience of others. Perhaps the basic question is whether ulcer is a hereditary or a learned phenomenon. It is interesting to speculate that the ineffective communication which may predispose to ulcer in the adult is a barrier between parent and child. The role of the mobile life situation of the military dependent is minimized by Hanson who feels that the soldier's family forms firm identification with the world-wide military society as a whole. This identification is, in general, an adequate substitute for the stability of a civilian community. This supports the observation in the present study that domestic problems as divorce, separation, et cetera, rather than separation on the basis of military assignment, proved a major stress to the youngster in the home.

An attempt has been made in the past to correlate specific psychological characteristics with gastric secretory activity, as measured by the serum pepsinogen, in a recruit population in order to predict the development of duodenal ulcer. Although interesting, the data were inconclusive. To date there is no clear-cut means of predicting the future behavior of duodenal ulcer. The present study suggests that draftees should be carefully screened prior to induc-

*Inquiries regarding the ulcer registry may be directed to R. B. Tudor, M. D., of the Quain and Ramstad Clinic, 221 North Fifth Street, Bismarck, North Dakota 58501.

tion as specified in AR 40-501, Chapter 2. There is a sufficiently high rate of complication in this age range, in general, to warrant such a degree of selection. Further, although the military, on both theoretical and practical grounds, has abandoned a classic Sippy program, a large number of physicians still indoctrinate their patients in rigid diet therapy. An individual so indoctrinated has great difficulty functioning in the military environment. Should ulcer develop during the first tour of duty, it behooves the physician to avoid creating a dietary cripple. A lack of consistency among physicians has, however, confused many patients. A final observation on diet is that many teenagers, in a reaction formation much akin to that of the juvenile diabetic, reject diet and

eventually all medical measures, including psychotherapy, because it sets them apart from their peers.

Conclusion

This paper reviews the experience with 36 young ulcer patients seen in an Army general hospital. The incidence of major complications was 52.7 percent with hemorrhage being the most frequently encountered. A complication was often the initial clue to ulcer disease. The only additional clue was a history of ulcer in another family member. The mechanism for adequate preinduction screening of ulcer patients exists; the present report emphasizes the need for its effective utilization.

(The references may be seen in the original article.)

A NONALLERGIST LOOKS AT ALLERGY*

L. Emmett Holt, Jr., MD† New York City, New Eng J Med 276(26):1449-1454, June 29, 1967.

Fifty years have gone by since the term allergy was first used by Pirquet, whose original observations entitle him to be regarded as the father of that branch of medicine. During that half century much has happened. The term allergy, sometimes used in a broader sense to include altered reactions of any kind, is generally restricted to a group of immunologic reactions exhibited by certain individuals that differ in kind or in degree from those of the species as a whole. Interest in these phenomena has been increasing rapidly in the more "developed" parts of the world. As the more lethal diseases have been conquered, one by one, allergy has become an increasingly important part of medical practice and has emerged as a specialty with its own practitioners, its own literature, its own special societies—local, national and international—and its specialty boards. This development is altogether logical. As diseases are phased out, efforts should be concentrated on those that remain; a concentration of interest invariably results in new knowledge as it has in this specialty.

As might be expected from my title, however, my present purpose is not to pin orchids on the allergists. It is to raise some questions that in my opinion deserve some serious thought. Allergists often find themselves on the defensive. They complain that the importance of their specialty is not duly appreciated by their medical colleagues in medical-school curriculums or in hospital services. They wonder why, in view of their specialized knowledge of such a common group of disorders. The answers to this question are complex and are perhaps more apparent to nonallergists than to the allergists themselves.

For one thing, allergy is a hybrid specialty. The clinical material that comes to the allergist—from which he derives his experience—is not his uniquely; it is shared with other specialties. Of the three major manifestations of allergy—asthma, hay fever and eczema—the internist and the pediatrician have plenty of opportunity to observe asthma, the nose-and-throat specialist has a great familiarity with hay fever, and the dermatologist and the pediatrician are no strangers to eczema. The various medications given for the relief of allergic symptoms are familiar to the other groups and, indeed, to physicians in general.

The unique experience and talent that the allergist may claim lies in three areas. He has knowledge of

*The Bailey K. Ashford Lecture given in San Juan, Puerto Rico, December 2, 1966.

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environmental allergens—their habits and their hiding places. By a history or by a personal search of the environment, he may be able to locate an unsuspected offender and, by eliminating it, restore the patient to health. The more severe the manifestations, the more dramatic the response. The allergists should be honored for these achievements. Two other areas belong exclusively to the allergist—the use of specific diagnostic technics—primarily, the immediate wheal-and-flare reaction and specific hyposensitization therapy. It is here that allergists and nonallergists often fail to see eye to eye. The skill with which the allergist performs these diagnostic and therapeutic manipulations is not questioned, but his interpretation of the results. To the allergist their value is unquestioned. He sees benefit with his own eyes every day. His patients claim therapeutic benefit and attest to it by their faithful return for “shots.” And how could these procedures have survived for the past half century unless they were of genuine value? They are fundamental tenets of allergy. An applicant for an allergy specialty board who questioned their value would find it difficult to be accepted. The skeptics are anathema to the allergist, but somehow or other they persist. It is they who limit the acceptance of allergy, believing that the allergists have not firmly proved their case. They are impressed by their own personal experiences. They are conscious of inaccuracies of specific allergic diagnosis and of failures of specific therapy in patients referred to the allergist, of undue restrictions of living habits that have produced no apparent benefit and of unimpressive results from specific therapy. Clinical impressions, no matter how accurate the observer, can lead one into error. All physicians are tempted to generalize from limited experience with individual cases, particularly when something fixes them firmly in memory. I am reminded of a distinguished internist—the chief of service in a New York hospital—in whose experience a patient had suddenly died when a needle was introduced into the thorax. On his service, thoracentesis was thenceforth rigorously banned, and when in the opinion of his junior colleagues such a procedure was urgently needed, the patient was surreptitiously transferred elsewhere. Personal experiences are extremely valuable. Their interpretation is the problem. Some unknown factor may influence a result, permitting a false conclusion regarding cause and effect. Perhaps the allergist and the skeptic are both right. Both can be honest observers, but both may be dealing with selected material. Patients who are benefited, or believe that they have been bene-

fited, tend to return to the allergist, whereas those unimpressed with such benefit revert to nonallergists. The variability of the results is generally admitted.

The value of specific diagnosis and therapy is not to be determined by the fact that these procedures have survived for half a century. Blood letting in medicine lasted for a much longer time. Nor should one be convinced by the fact that considerable numbers of patients are certain of benefits received. When blind studies of any doubtful therapy are carried out, there are always substantial numbers of patients who have received placebos who are altogether certain of the benefit they have received. Psychologic factors have an extraordinary way of coloring results. To obtain final answers on disputed questions is a difficult matter in which the aid of the statistician must often be enlisted to ensure against errors of selection, objectivity of the data and all possible measures to avoid bias in the presentation as well as the compilation of results, their analysis and their presentation.

After this introduction, it would be appropriate if I could present now the results of studies in which specific diagnosis and specific therapy were conclusively evaluated to everyone's satisfaction once and for all. I cannot. There are imperfections in every existing study. Final answers have a way of eluding search. There are hidden variables that affect the phenomena one is concerned with. All I can do is to describe some studies that my colleague Dr. Fontana and I have carried out bearing on these two problems: the diagnostic value of immediate skin reactions; and the value of hyposensitization therapy.

Observations on the Skin Test

I shall confine this discussion to the immediate wheal-and-flare reaction, accompanied by pruritus, appearing within minutes of the application of an antigen and disappearing within an hour or so. There is no question that this is a hypersensitive reaction—a consequence of the reaction between antigen and a specific type of antibody—a reagin. It is an allergic response in that it represents a reaction that is not universal. A person exhibiting such a reaction can be classed as allergic, and often is. But does this mean that the reagin in question is responsible for allergic symptoms from which he may suffer? Originally,—in the early days of allergy,—this was thought to be so, and heroic efforts were made to avoid all antigens to which the skin reacted. Dr. Lewis Webb Hill, of Boston, showed me histories of two patients referred to him who, on the basis of skin tests, had been given lists of more than 400

antigens to avoid. Fortunately, it soon became apparent that this extreme point of view could not be upheld. Positive skin reactions were found in many persons with no history of allergy. In fact, Schloss and his co-workers observed that after the first contact with a new food, an infant commonly gave a positive skin test and other antibody responses as well without the development of symptoms. Allergic patients likewise frequently gave skin reactions to antigens that could not be blamed for their symptoms. Cases were also encountered of marked clinical sensitivity with a negative skin test. The doctrine was modified. A positive skin test was an indication of actual or potential clinical sensitivity—of clinical sensitivity past, present or future. Skin tests were still worth doing; they were regarded as guides to the agent causing the symptoms. The modern attitude prevailing among allergists is that they provide confirmatory evidence. From a carefully taken history one might suspect a particular offender, but the additional finding of a positive skin test would increase the likelihood that the specific agent was the offender. It has seemed to me somewhat illogical to regard the skin test as significant when it confirms the history and to disregard it when it fails to do so. By so doing, one is really relying only on the history.

To ascertain the diagnostic value of a positive skin test, one would like to know the frequency of positive reactions in nonallergic and in allergic patients. The literature on the prevalence of positive skin reactions in nonallergic persons is surprisingly scarce. Rackemann and Simon studied the reactions to eight different antigens in 60 patients with nonallergic complaints, only four of whom had a history of allergy. Fifty percent gave positive reactions to one or another antigen, most commonly to ragweed. Grow and Herman tested 150 apparently normal medical students with 13 common antigens. Of this group 110 had no history of allergy. Positive reactions to one or more antigens occurred in 55.5 percent of the entire group, this figure being virtually the same (54.4 percent) in the smaller group with no history of allergy. The most common reactants were house dust (38.6 percent) and orris (34.6 percent). Efron and Boatner studied skin reactions to house dust and ragweed in normal and allergic persons and reported a high prevalence in the latter as compared to the former. Lindblad and Farr tested 100 normal subjects with five inhalant antigens: ragweed, house dust, mixed trees, mixed grasses and mixed molds. Up to 50 percent showed positive reactions, depending on the dosage employed. The reac-

tions were frequently confirmed by passive transfer. A few years ago Dr. Fontana and I studied positive skin reactions to 13 inhalants and 12 foods in allergic and nonallergic children attending the outpatient department of Bellevue Hospital. The results are shown in Table 1. It is quite apparent that the percentage of positive reactors to any antigen is much higher in the allergic than in the nonallergic subjects. Nevertheless, the percentage of false-positive reactions to certain antigens was considerable: house dust (42 percent); strawberry (20 percent); spinach (18 percent); and chocolate (11 percent). One might be tempted to conclude that the greater frequency of skin responses in the allergic patients is evidence of their specificity. It is also possible, however, that the skin of the allergic patient is simply more reactive to nonspecific or specific stimuli alike. In fact, Kierland and others have obtained evidence that this is indeed true, vasomotor reactions to a variety of nonspecific stimuli occurring far more frequently in allergic subjects.

What conclusion may one draw regarding the value of the skin test as revealing the specific antigen responsible for an allergic manifestation? My conclusion is that even if there is a measure of correlation between the skin test and clinical hypersensitivity, the frequency of error—of drawing a false conclusion, with troublesome consequences—is such that the usefulness of this procedure must be seriously questioned.

An environmental test in which withdrawal and challenge with a suspected antigen are alternated should give reliable information, particularly if it is repeated. But withdrawal alone followed by symptomatic improvement may be misleading, as illustrated by observations in Boston made by Long et al. Fourteen asthmatic children skin sensitive to house dust were placed in specially cleaned rooms at the Massachusetts General Hospital, with prompt disappearance of symptoms. Without their knowledge dust from a vacuum cleaner collected from their own homes was introduced into their rooms and in none of these children did the symptoms return. A minority are said to have relapsed when returned to their home environment. If the challenge had not been applied, the elimination of house dust would have been credited with the improvement in the hospital. The skin test in each of these cases gave a false-positive result.

Observations on Hyposensitization

To evaluate specific hyposensitization therapy critically, it is necessary that controlled observations

TABLE 1. Incidence of Positive Skin Reactions in Allergic and Nonallergic Patients.*

Antigens	Concentration (PNU/C.C.)	No. Patients Tested	Allergic Patients (% Positive Reactions)	Non-allergic Patients (% Positive Reactions)
<i>Inhalants</i>				
Dust concentrate		200	88	42
Feathers	1,000	200	59	7
Pyrethrum	1,000	200	28	5
Penicillium	1,000	182	9	5
Alternaria	1,000	200	35	2
Horse dander	1,000	168	19	2
Wool	1,000	200	28	2
Cat dander	1,000	176	26	1
Cottonseed	1,000	200	17	1
Orris root	1,000	150	12	1
Ragweed	500	200	56	1
Timothy	500	200	44	1
Dog dander	1,000	194	24	0
Plantain	500	200	32	0
<i>Foods</i>				
Strawberry	3,500	66	33	20
Spinach	3,500	62	26	18
Chocolate	3,500	113	19	11
Orange	3,500	117	25	5
Pork	3,500	64	9	3
Wheat	3,500	123	26	1
Rye	3,500	70	20	1
Codfish	100	66	45	0
Cow's milk	3,500	124	15	0
Egg white	100	122	16	0
Lamb	3,500	61	13	0
Peanut	100	63	9	0

* Reproduced from Fontana et al. with the permission of the publisher.

be made and that they be made "blind," neither the patients nor the evaluator being aware of the nature of the therapy. As far as possible the subjects should be comparable, and the presence or absence of the specific therapy should be the only variable. The difficulties are great. The activities and antigen exposure of ambulant patients are difficult to control, and one must rely on records of symptoms that are in large part subjective—symptoms that occur while the subject is not under direct observation. Certain other precautions must be taken to avoid possible bias in the evaluation of results.

A number of such studies have been undertaken to evaluate the efficacy of hyposensitization with ragweed antigen in ragweed hay fever. Fontana, Mainland and I have done one ourselves. All these studies can be criticized on one ground or another; none of them are perfect. The results and conclusions drawn from these studies differ. I shall not

undertake a detailed analysis of them; time does not permit, and they are all published. I shall briefly summarize our own study and present its salient features. The study was carried out on 92 ragweed-sensitive children whose symptoms corresponded closely with the ragweed season and who had not previously received hyposensitization therapy. Approximately half received ragweed injections for four months before the ragweed season, the others receiving a placebo. The nature of the injections was not known to the patients or to the physicians, who evaluated their symptoms once a week during the ragweed season and collected symptom cards filled out by the family during the preceding week. All these children were followed through at least one ragweed season, smaller numbers being followed for two, three, four or five seasons. The comparison was based on three symptomatic criteria: the number of days during the season in which eye symptoms were noted; the number of days in which nasal symptoms were noted; and, finally, the number of antihistamine pills taken for the relief of symptoms. The cards were analyzed before the code was broken. Table 2 shows the results in individual seasons. A positive P-R indicates that the ragweed group fared better, and a negative P-R that the placebo group fared better. It will be noted that considerable seasonal variations were seen. In some years the placebo, and in others the ragweed group fared better. Only in one year (1961) was there agreement between the three criteria, and the statistician has stated that the evidence from this year is only slightly suggestive in favor of the hyposensitization group. The numbers followed for more than three seasons, though somewhat smaller, fail to confirm this trend. I am presenting graphically the data for nasal symptoms, ocular symptoms and self-medication on individual patients followed for three or more seasons. One can see at a glance that some fared better and some worse as time went on, the largest number exhibiting no change and no difference between the placebo and the ragweed group being apparent.

Bias may occur in the presentation of data as well as in their collection, and I must admit that the three of us concerned in this study were all biased. Our biases, however, were different. Dr. Fontana, an allergist, was admittedly biased in favor of the value of specific therapy. I myself, a nonallergist, was an unbeliever, and the third partner, Dr. Mainland, a professor of medical statistics, was biased in favor of statistics. We neutralized each other. We had

TABLE 2. Mean Values of Symptom Days and Number of Tablets in Second Ragweed Season.*

Year of Entry	Number of Patients		Nasal Symptoms, Days(%)†			Eye Symptoms, Days(%)†			Brompheniramine Maleate Tablets Per 30 Days of Season, Av		
	P‡	R§	P	R	P-R	P	R	P-R	P	R	P-R
1960	6	8	82	59	+23	40	31	+9	6.3	12.6	-6.3
1961	22	19	75	56	+19	39	15	+24	18.6	7.5	+11.1
1962	6	4	52	70	-18	23	51	-28	5.1	17.1	-12.0
1963	3	5	71	56	-15	18	35	-17	22.3	27.7	-5.4

* Reproduced from Fontana et al. with the permission of the publisher.

† Symptom days expressed as percentage of total days of ragweed season.

‡ P = placebo patients.

§ R = patients treated with ragweed extract.

many arguments about the wording of the paper and the conclusions, but our two conclusions are given verbatim:

1. Even if the allergen injections may have had some beneficial effect on some children, the amount of benefit on this group as compared with the placebo group was indistinguishable from differences that occur in pure randomization experiments.

2. There was found no justification for promising any greater benefit to children treated with allergen than they would manifest if they received placebo injections.

As pointed out above, our study is not a perfect one, nor is anyone else's, according to the best of my knowledge. There are limitations in the accuracy of all of them. One cannot be sure how much inhaled pollen an individual subject received. There are other variables in the life of each subject. And the evaluation was largely based on subjective data. Our conclusions have not convinced the allergists, who refer to studies carried out by allergists themselves who have reported encouraging results from hyposensitization. Obviously, the last word has not been said. I cannot refrain from mentioning, however, that a more accurate study can be carried out that, it is hoped, will overcome some of these difficulties. An environmental controlled unit has been constructed in New York City—a suite of rooms in which air filtration has been carried out to an unprecedented degree. Pollen counts are maintained at any desired level and are continuously measured by an electronic counter. Devices are now available to make objective measurements of nasal capacity. The major difficulties of past studies can therefore be overcome, and we should not have long to wait for the results. We do not have to wait for August to come; an artificial ragweed season can now be produced for study purposes at any time.

The Future of Allergy

I have cited some observations in support of the thesis that the limited acceptance of allergy by its confreres is in part due to a tendency to cling to dogmas unconvincingly demonstrated to others. There are other reasons why allergy is in a sense a stepchild of medicine. The period since World War I has seen a phenomenal development in American medicine—in medical science. The preclinical sciences—notably biochemistry and immunology—have flourished, and the clinical sciences have profited correspondingly. Academic medicine—full-time medicine—came into being, supported at first by private and recently more by public funds. Strong clinical departments developed that, particularly in internal medicine and pediatrics, nourished the preclinical branches in their bosoms and in the process grew strong themselves. Their young men learned to think in chemical, immunologic and physiologic terms. Of course, this has not been an entirely unmixed blessing. A schism has been noticeable between “town and gown”—between the private practitioner and the full-time academician that from time to time finds expression. The successful practitioner who considers himself the true master of his subject is sometimes inclined to look askance at the “ivory-tower doctor” who obtains preferment, and at times the feeling is returned. The academician believes that preferment is due to those who have the ability to advance as well as to employ knowledge in their chosen field. Perhaps each is in fact a little envious of the other. For the most part these feelings do not show and are supplanted by the realization that physicians are, after all, one family. Certainly, strenuous efforts are made to bridge the gap. There are also the straddlers, who share the best of both worlds. What does all this have to do with allergy, and where does allergy stand in rela-

tion to the town and gown? It is dangerous to generalize, and of course there are exceptions that can be cited to disprove what I am about to say, but my impression is that allergists as a whole are disproportionately represented on the "town" side and meagerly on the "gown" side as compared with other branches of medicine.

There are signs that things are changing. One can find scholars in the field of allergy who are abreast of the immunology of today. Allergy is beginning to develop ivory towers of its own where pure immunologists are nurtured. Such centers are few in number but are developing. The recent programs of the American Academy of Allergy reflect this renaissance. There is a growing interest in hypersensitivity of the delayed type conveyed by lymphocytes as well as hypersensitivity of the immediate type mediated by serum antibodies. There is increasing interest in autosensitization as a cause of allergic manifestations to allergens formed within the body rather than those obtained from the environment. It is not known how frequently entrinsic antigens are responsible. The role of autosensitization to human skin as a cause of infantile eczema has been investigated in our clinic by Hashem and her collaborators, who found evidence of such sensitivity in peripheral lymphocytes cultured from these patients. It was not proved that the sensitized lymphocytes were responsible for the eczema, even though the controls did not show this, but the sensitized lymphocytes were there.

I have been accused of trying to put allergists out of business by raising doubts of the efficacy of their present practices, which might discourage those wishing to enter this field. Nothing could be further from my thought. To me allergy is a fascinating subject with no end of intriguing problems to study and to solve. Its surface has only been scratched. We know some factors that initiate allergic reactions, but there is much more to be learned about them and about contributory factors. What is there peculiar about certain end organs that causes the peculiar localization of allergic responses? Is allergy a disease of civilization, as seems true of infantile eczema? There is now highly suggestive evidence that transplantation of populations to countries where they can enjoy European or American standards of living increases the incidence of the disease. Are we by "improving" our nutrition in the hope of increasing antibodies to prevent infection perhaps promoting the formation of antibodies that are responsible for allergic reactions? We need to find answers to these and many other questions. We need critical investigators well trained in the fundamental disciplines and particularly in immunology to fight our allergic troubles, able to think for themselves unfettered by doctrines of the past. I believe allergy is on the way, and I say "Hats off to the future scholars of allergy."

(The figures and references may be seen in the original article.)

POISON CONTROL†

Arthur J. McBay PhD,‡ Boston, New Eng J Med 277(10):534-535, Sept 7, 1967. Reproduced with the permission of The New England Journal of Medicine.

Over eight thousand deaths per year are reported in the United States as due to poisoning. The actual number resulting from poisoning is a great deal higher than this figure. The discovery of a fatal case of poisoning depends on the quality of the medicolegal system involved in the investigation. In some jurisdictions, such cases are thoroughly studied, and, in others there is practically no investigation. The mere finding of a dead body with an empty drug

container nearby is enough, without the benefit of autopsy or toxicologic analysis, to satisfy some investigators that poisoning was responsible.

Statistics on cases of nonfatal poisoning are even less reliable. It is estimated that about 1,000,000 such cases occur in the United States per year. Many of the reported ingestions are obtained from distraught parents who telephone to ask for information because they have found an empty container near their child. It is clear that both discovery and reporting of cases of poisoning is often based on inadequate and unreliable procedures. Remedial

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legislation to require thorough toxicologic analysis in all medicolegal cases is essential. Massachusetts does require that a physician report any acute poisoning caused by narcotics, barbiturates and amphetamines to the Commissioner of Public Health.* However, the reporting of this limited and special group has little relevance to poison control. The lack of mandatory reporting of all cases of poisoning that a physician may come across obscures the frequency of poisoning and impedes the development of therapeutic as well as preventive measures.

The treatment of those who have been poisoned is also subject to criticism. Unfortunately, poisoning has been somewhat neglected by the medical profession. Very little in the medical-school curriculum is devoted to the subject of chemical and drug intoxication. There are no clinics where an intern may obtain training in the treatment of poisoning, and there are no specialties in the diagnosis and treatment. If death and injury after poisoning were rare, there would be little need for training in this field; however, the practicing physician comes in contact with the poisoned patient very often.

Poisoning may be accidental, suicidal or homicidal, may occur from deliberate or inadvertent use of chemicals or drugs or may arise from an occupational or industrial hazard. Toxic substances range from the common poisons through the radioactive substances, and poisoning may be immediate or delayed and detection easy or difficult. Industrial medicine is alert to toxic hazards to workmen and exercises systematized efforts in poison control and prevention, largely, however, because of the legal protection of the health of the employee.

There are poison information centers in major cities throughout this country. The impetus for the establishment of the centers was the widespread anxiety about the accidental ingestion of poisonous substances by small children, and their purpose was to provide information on what a product might contain and on how to counteract the effect of any harmful ingredients. Although the centers have doubtless saved many lives and soothed the anxieties of countless parents, they do not approach the concerted medicolegal effort that should be made in poison control.

* *Mass. Gen. Laws Ann. Ch. 94, § 187c.*

In Europe, centers have been established for the treatment of poisoned patients. The physicians in charge specialize in this area of medicine, and adequate supporting personnel are available to make toxicologic analyses. Special equipment is reserved for these patients; they do not have to compete with transplant or other patients for the use of hemodialysis apparatus. Furthermore, those who recover after deliberate attempts are referred to psychiatrists for treatment of their emotional problems. Of course, this may be easier to accomplish under a system of socialized medicine such as exists in parts of Europe, but the fact remains that there are many such centers in Europe and apparently none in the United States.

Conclusions

It is believed that many useful lives could be saved if all persons suspected of being poisoned were examined and treated by physicians knowledgeable in the treatment of poisoning. Investigators should obtain adequate histories and make a search of the environs to ascertain what poison was taken. Complete information files should be available so that the harmful ingredients of any commercial product could be discovered. Analytical facilities to identify unknown materials and to perform toxicologic examinations should also be available, and the necessary equipment should be used by personnel with experience in the treatment being given. The results of treatment should be evaluated by experts on the basis of drug levels of specimens as well as clinical and physical determinations. If such a course is indicated, the patient who recovers after a suicidal attempt should receive continuing psychiatric treatment. The case should be fully documented so that others may profit from what is learned. All fatal poisonings should be given extensive medical and legal investigation.

It would be desirable for a metropolitan hospital to establish a poison control center where the program mentioned above would be available. This center could treat poisoned patients, advise others, train medical personnel and perform research.

DIAGNOSIS AND MANAGEMENT OF INJURIES TO THE EYE

W. Howard Lewin MD, St. Louis, Missouri, Industr Med Surg 36(9):588-590, Sept 1967.

As in all fields of medicine, a detailed history of the eye injury should be obtained on the initial visit. This should include careful inquiry as to when, where, how and what caused the accident. A visual acuity test should be performed on each eye and a history of previous eye trouble, if any, should be noted. Most patients will not attempt to malingering on the first visit. However, this may become a major problem on subsequent visits when the pain and the fear of loss of eyesight has subsided and the problem of compensation or legal proceedings becomes a factor in the attitude of the patient.

To make a correct diagnosis of an eye injury, it is most important to know how to adequately inspect an eye. In our office numerous eye injuries are seen daily and many of these injuries are of industrial origin. We first stand back and look at the eyes and eyelids grossly, noting in particular the amount of blepharospasm and irritability of the involved eye. The eyelashes should be carefully inspected, noting any aberrant lashes rubbing on the eye itself. Aberrant lashes are removed by using a fine cilia forceps and grasping the lash close to the lash root. For recurrent trichiasis, electrolysis of the lash root is the treatment of choice. Not infrequently, it is found that a loose eyelid cilia or a small piece of hair (perhaps from a recent haircut) has become lodged in one of the puncta and protrudes slightly, rubbing on the eye. This is treated by grasping the cilia and pulling it out of the punctum. Marginal sebaceous blebs of the lids may cause a foreign body sensation and may be removed simply by vigorously wiping them off.

The position of the lacrimal puncta of the upper and lower eyelid is next examined, as an eversion or ectropion of the puncta may account for tearing and irritation of the eye. This condition requires eyelid surgery for correction. Numerous hard palpebral conjunctival concretions are found in many patients. These may present a feeling of irritation if they erode through the conjunctiva and rub on the eye itself. If this is the cause of the irritation, the concretion may be easily removed by using a small, sharp needle or foreign body spud. Hard, rough scar tissue

of the palpebral conjunctiva from previous eyelid injuries may cause an irritation of the eye or even a corneal abrasion. This is treated by excising the scar tissue.

The cul-de-sacs are frequently neglected in examination and deserve special scrutiny. The lower cul-de-sac area may be inspected by merely pulling the lower eyelid down and stretching it to bring the cul-de-sac into direct view. The upper eyelid cul-de-sac is examined by everting the upper eyelid, then by exerting pressure through the skin of the eyelid above the upper margin of the tarsal plate, using a cotton tip applicator stick. Sometimes foreign bodies are found lodged in the upper cul-de-sac. Especially in chemical injuries should the upper cul-de-sac area be inspected and irrigated. Sometimes a so-called "lost" contact lens may be discovered in the upper cul-de-sac.

Lacerations of the eyelids should be carefully repaired with special attention to exactly reapproximating the lid margins. One should be especially aware of the importance of the lacrimal apparatus and also consider the dangers of scar tissue traction on the eyelids causing an ectropion or entropion of the lids. It is our opinion that eyelid lacerations should be repaired by an ophthalmologist or a plastic surgeon, and by a general surgeon only if he is thoroughly familiar with the eyelids and eye problems and possible complications. Frequently the underlying eye may be severely injured even though at first glance the eyelid laceration may seem the only injury.

Examination of the cornea should be in a systematic fashion, noting any old scars and foreign bodies. It is our custom to note these, as in reference to a clock dial, using as points of reference the pupillary center and the limbus. For instance, it could be stated that a superficial corneal foreign body of the left eye was noted at 3 o'clock 2 mm from the limbus; or an old deep corneal horizontal linear scar was noted in the right pupillary area at 12 o'clock. One cannot overemphasize the importance of keeping accurate records for future use in medicolegal proceedings. Superficial corneal foreign bodies are removed by using good illumination, adequate magnification, and a small, sharp foreign body spud or

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the tip of a hypodermic needle. The foreign body, and its surrounding so-called rust ring, should be completely removed. If this cannot be accomplished on the initial visit, usually in a few days the rust ring area will have softened enough for easier removal.

Postremoval Management

We do not advocate the use of an eye patch following the removal of the foreign body unless the abraded area is extensive. A neglected corneal foreign body may lead to necrosis of the surrounding corneal tissue and to corneal infection. Prompt cauterization of the foreign body site with Gifford's iodine solution may halt an impending corneal ulcer or abscess.

Magnetic removal of an embedded corneal foreign body is more difficult. As the metallic foreign body is deep in the corneal stroma, careful removal is necessary to prevent the foreign body from being pushed posteriorly into the anterior chamber. An incision can be made with a No. 11 Bard-Parker blade through the wound of entrance, enlarging the opening and incising down to the foreign body, then applying the electromagnet.

If the foreign body is nonmagnetic, the incision has to be large enough to grasp the foreign body with a forceps or to pry it from the cornea with the knife-blade tip. Foreign bodies embedded in the bulbar conjunctiva usually cannot be removed by a foreign body spud, but must be managed by forceps, grasping a small piece of the bulbar conjunctiva, in which is contained the foreign body, and excising the bulbar conjunctiva with a scissors. If care is taken not to grasp too large a piece of conjunctiva, no suture is required. Lacerations of the bulbar conjunctiva, if extensive, require suturing with 6-0 silk.

Abrasions of the cornea are painful and are diagnosed by the use of dye instilled onto the surface of the eye from a moistened fluorescein paper strip, noting the yellow/green staining area which is the site of the abrasion. Corneal abrasions (if they have clean-cut margins), are treated by antiseptic or antibiotic eyedrops instilled into the eye and a tight eye bandage, with oral analgesics for pain. If the edges of the abrasion are undermined, healing is usually promoted, and chances of recurrent erosion of the cornea are reduced if the loosened corneal epithelium is wiped off with a moistened cotton applicator stick. Short-acting mydriatics may be used to relieve a secondary traumatic iritis. A subconjunctival hemorrhage may mask the wound of entrance of a foreign body or conceal a scleral laceration. If

there is any history of a possible foreign body it is wise to x-ray the eye.

An uncommon but very disconcerting injury to the patient—also to the physician, if he is not aware of the treatment of choice—is the indelible pencil or indelible ink stain of the bulbar conjunctiva. This type of stain does not respond to simple irrigation, or it may be too widespread in its involvement to make excision feasible, but will respond to a freshly prepared 5% solution of tannic acid applied on a cotton pledget over the involved area. A bleaching effect takes place, not immediately but usually by the next day. Some foreign bodies are rather inert and are tolerated by the eye surprisingly well. Glass particles, if they are not readily removable from the cornea, can be left alone.

Subconjunctival hemorrhage without other signs of eye trauma will usually absorb in 7 to 14 days. Periorbital ecchymosis, if mild, requires no treatment, but absorption of edema and blood will be hastened by any oral proteolytic enzyme. Retrobulbar hemorrhage following trauma manifested by proptosis, diplopia, and immobility of the eye responds to proteolytic enzyme treatment. Anterior chamber hemorrhage requires hospitalization and is treated by bed rest, binocular eye patching, and sedation. A severe secondary hemorrhage may occur 3 to 5 days after the initial hemorrhage. If a complete anterior chamber hemorrhage develops, with a so-called 8-ball pupil, the intraocular pressure may rise and blood staining of the cornea and secondary glaucoma may develop. This condition is treated surgically employing fibrinolysin to help dissolve the blood clots.

In our experience, proteolytic enzyme does not help in treating intraocular hemorrhage. Vitreous hemorrhage may take weeks or months to absorb and may easily mask a retinal tear and detachment. Iris tears may result in a permanently dilated pupil. Local areas of iris atrophy may occur in the area of the tear, or a peripheral concentric iris tear, known as an iridodialysis, may be noted. Any damage to the iris may result in an anterior or posterior synechia and a possible late complication that may result is a secondary glaucoma.

Chemical injuries to the eye demand immediate attention. What the patient does in the first 60 seconds may do more to save his eyesight than anything any of us can do when we see him in our office or hospital. Immediate irrigation with water in copious amounts will flush out the chemical, dilute its concentration, and reduce its damaging effect on the

eye. There is no need to waste time looking around for a neutralizing agent. In many cases the exact nature of the chemical is unknown or such information is not immediately available.

Acid solutions do their damage to the eye immediately and are as a rule easier to treat and less damaging than alkalis. Alkaline chemicals continue to exert their damaging effect until prolonged and careful irrigation removes them from the eye. The eye should especially be inspected for lime particles;

these should be removed from the eye, paying careful attention to the conjunctiva of the upper lid and upper cul-de-sac. In acid injuries the damage to the eye can be evaluated on the initial visit. In alkali injuries the damage may be seen as more severe on the second or third day. The prognosis must be guarded in alkali injuries until such time as damage to the cornea can be evaluated. Complications include scarring of the cornea and adhesions between the eye and the eyelids.

COLCHICINE-QUININE THERAPY FOR ACUTE FALCIPARUM MALARIA ACQUIRED IN VIETNAM

LTCOL Richard C. Reba MC USA and LTCOL Thomas W. Sheehy MC USA,
JAMA 201(7):553-554, Aug 14, 1967.

Combined colchicine-quinine therapy significantly reduced the recrudescence rate of nonimmune individuals with *Plasmodium falciparum* infections acquired in the central highlands of Vietnam.

During the past two years, a large number of chloroquine-resistant *P falciparum* infections have been observed among nonimmune American soldiers serving in South Vietnam. Ninety percent or more of these individuals suffering with their first infection either failed to respond to chloroquine or suffered a recrudescence of their infection after a three- or even a seven-day course of chloroquine phosphate. Quinine sulfate therapy was much more effective against the strains of *P falciparum* encountered in central Vietnam; indeed, only four of 3,300 cases of malaria in nonimmune troops observed by us failed to respond clinically to quinine. However, it seldom produced a radical cure of *P falciparum* infection incurred in Vietnam, for 60 percent to 75 percent of the patients treated solely with quinine had a recrudescence of their infections. This led us to evaluate several combined-therapy regimens for the treatment of falciparum malaria. One of these regimens employed combined colchicine-quinine therapy for the acute malarial attack. Colchicine was selected to be used with quinine because of its known antimiotic and antienzymatic activity and be-

cause screening studies made during World War II showed colchicine to have some schizonticidal activity against *P vivax*.

Materials and Methods

Twenty-two nonimmune Americans (seven Negro men and 15 white men), all from the same military unit, were included in the study (group 1). These individuals ranged in age from 18 to 31 years. All were experiencing their first *P falciparum* infection. These had been incurred in an area known to be highly endemic for chloroquine-resistant *P falciparum* malaria. Prior to the onset of clinical illness, each individual had taken a weekly tablet containing chloroquine base (300 mg) and primaquine base (45 mg). Thirty-eight nonimmune men, 19 to 38 years of age, who acquired their infections in the same area, served as controls for this study (group 2).

The following studies were performed on each patient after admission to the study: white blood cell count, urinalysis, hematocrit and blood urea nitrogen determinations, thick and thin blood smears for percent parasitemia. These tests were repeated weekly throughout the period of treatment and observation. Thick and thin blood smears were also performed on three consecutive days before discharge.

Treatment for group 1 patients was initiated as soon as the diagnosis of *P falciparum* infection was confirmed by parasite identification. It consisted of the oral administration of colchicine, 0.5 mg every hour on the day of admission for a total of 6 doses

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Reprint requests to Walter Reed General Hospital, Walter Reed Army Medical Center, Washington, DC 20012 (Dr. Sheehy).

and 0.5 mg every 12 hours on the following day (total doses, 4.0 mg). Quinine sulfate was administered concurrently, 650 mg every eight hours for 14 days. After the completion of combined colchicine-quinine therapy, each patient, with one exception, was observed in the hospital for an additional 21 to 45 days. Patients in group 2 were treated with quinine sulfate, 650 mg every eight hours for 14 days. During the observation period, a regimen of reconditioning exercises was started. The patients were returned to full activity one to two weeks after the completion of therapy. During the observation period, chemoprophylaxis for malaria was not given so that the value of previous colchicine-quinine therapy could be evaluated.

Results

Eighteen of the 22 patients in group 1 became afebrile 8 to 72 hours after the start of therapy; three remained febrile for periods ranging from 84 to 96 hours; and one patient had a delayed response to therapy. This patient was febrile for the first seven days of therapy and was inadvertently discharged to duty three days after finishing colchicine-quinine therapy.

Seventeen patients (77 percent) remained well during the period of hospitalization and observation. These individuals were discharged as cured and were returned to units in the immediate area. Five patients (two Negro men and three white men) had recrudescences of their infections 6, 11, 15 (two), and 19 days after treatment. One patient, the individual discharged early, returned to his unit, where he spent one night in the base camp and then went on a field operation in an area highly endemic for malaria. Seven days later, 11 days after the completion of colchicine-quinine therapy, he again became ill and was found to have a blood smear containing *P falciparum*. He had not taken chloroquine-primaquine prophylaxis during the period he was absent from the hospital, and although reinfection was possible, this individual was thought to have had a recrudescence of his infection. Few side effects were encountered as a result of combined colchicine-quinine therapy. Six patients in group 1 and eight in group 2 had loose stools prior to therapy. All the patients in group 1 had diarrhea by the second day of treatment, but it subsided either spontaneously or after treatment with paregoric therapy.

All the patients in group 2 had a clinical response to quinine therapy, but 28 had recrudescences one to four weeks after completion of quinine therapy. Ten (27 percent) remained well for four weeks after therapy and were considered to have had a radical cure.

Comment

The emergence of chloroquine-resistant *P falciparum* malaria in Vietnam has restimulated malaria research and drug evaluations reminiscent of the activity in these fields during World War II. Colchicine was evaluated for its antimalarial activity in that era; and in most instances, it was found to be less active than chloroquine against avian strains of malaria. Its prophylactic and curative activity was also evaluated against human strains of *P vivax*. In one study, six volunteers were inoculated with the Chesson strain of *P vivax* malaria. After they became ill, a preliminary course of quinine therapy was administered, 1.5 gm daily for six days; then they were treated with colchicine, 1.5 mg daily for an additional six days. Two of the volunteers had an early recrudescence of their infection following therapy (5 to 7 days); two had delayed recrudescences (26 and 29 days); and two had a radical cure of their infections. In a similar study of six volunteers infected with the St. Elizabeth strain of *P vivax*, similar treatment with quinine and colchicine was found to be ineffective. Five of these patients had prompt recrudescences following therapy (7 to 10 days), and only one had a delayed recrudescence of his infection (46 days). However, in neither study was colchicine used concurrently with quinine.

Quinine is concentrated by parasitized red blood cells, but its mode of plasmodial destruction is not clear. Colchicine has the capacity to penetrate the red blood cells, where it interferes with the enzymes concerned with the recycling of tetrahydrofolate and with the dehydrogenases. It also is capable of causing mitotic arrest of cells, particularly in tissues with high rates of cell division. These properties of colchicine led us to believe it might potentiate the antiplasmodial activity of quinine. In the present study, concurrent colchicine-quinine therapy proved more effective than quinine therapy alone in achieving radical cures of *P falciparum* infections (77 percent [17] vs 27 percent [10]). Further study of colchicine and perhaps other folic acid antagonists, such as methotrexate alone or in combination with

other antimalarials, may provide new therapeutic combinations that are highly effective against chloroquine-resistant *P falciparum*.

Generic and Trade Names of Drugs

Chloroquine phosphate—*Aralen Phosphate*.
Quinine sulfate—*Coco-Quinine*.

(The references may be seen in the original article.)

MEDICAL ABSTRACTS

THE PROPER USE OF NEWER DIURETICS

John H. Laragh MD FACP, Ann Intern Med 67(3):606-613, Sept 1967.

The continued introduction of new and more potent diuretic agents has imposed an increasingly greater responsibility for understanding the pharmacological effects of these agents and the altered physiological setting in which they are administered. This is especially true of the two new and very potent agents that have recently become generally available; ethacrynic acid and furosemide.

The thoughtful use and the study of diuretic agents will allow us to learn much more about the basic nature of the intrarenal and the extrarenal mechanisms involved in sodium conservation and then to evaluate their relative participation in a particular clinical problem. Some day it may be possible to characterize precisely the edematous states of heart failure, cirrhosis, and nephrosis in terms of a lesion involving a particular renal tubular transport system.

HYPOPARATHYROIDISM—CLINICAL OBSERVATIONS IN 35 PATIENTS

Alexandra Dimich MD, Paul B. Bedrossian MD, and Stanley Wallach MD, Arch Intern Med 120(4): 449-458, Oct 1967.

The clinical features and details of therapy of 34 patients with postoperative and spontaneous hypoparathyroidism observed during a ten-year period in a single geographic area have been reviewed. The usual presenting symptoms were carpopedal spasm and convulsions in spontaneous hypoparathyroidism and carpopedal spasm alone in postoperative hypoparathyroidism. The incidence of lenticular abnormalities was significantly higher in both types of hypoparathyroidism than in previously reported series. Unexpectedly high incidences of hypertension, calcific tendinitis, roentgenographic skeletal ab-

normalities, and elevated serum levels of alkaline phosphatase activity were also noted. Twenty-three patients were treated with calcium or ergocalciferol, or both, for periods of one to ten years. All patients improved upon attainment of normocalcemia and remained free of symptoms resulting from increased neuromuscular irritability as long as normocalcemia was present. However, in eight patients, episodes of hypercalcemia and/or hypercalciuria occurred during therapy. Treatment did not prevent the appearance of lenticular abnormalities in three patients. These data suggest that present modalities of therapy of this perplexing disease are not completely satisfactory.

SOLITARY PULMONARY LESIONS— COMPUTER-AIDED DIFFERENTIAL DIAGNOSIS AND EVALUATION OF MATHEMATICAL METHODS

Arch W. Templeton MD, Carl Jansen MD, James L. Lehr BA, and Robert Hufft MA, Radiology 89(4):605-613, Oct 1967.

Two hundred forty-two cases of histologically proved solitary lung lesions encompassing nine disease entities have been reviewed. Sixteen roentgenographic and four clinical variables have been evaluated for each case. These data have been compiled into a frequency distribution table and prior probability matrix by the computer.

This study has demonstrated the difficulty of using statistical methods to diagnose a given case of solitary lung nodule with limited proved case material. If the number of proved cases per disease is too small in relation to the number of variables being evaluated, a realistic description of the disease is not provided. It is hoped that other interested groups may use the work sheet or some modification thereof to collect more data. By pooling such information, accurate statistical descriptions of diseases may be obtained to diagnose solitary lesions of the lung.

TREATMENT OF SARCOIDOSIS—REPORT OF A CONTROLLED THERAPEUTIC TRIAL

D. Geraint James MA MD Cantab FRCP, L. S. Carstairs MB Lond DMR, Joan Trowell MB Lond, and O. P. Sharma MB Gwalior, Lancet II(7515): 526-528, Sept 9, 1967.

Eighty-four patients with histologically confirmed sarcoidosis and multi-system involvement received six months' treatment with prednisolone, oxyphenbutazone, or a placebo, supplied as identical tablets and allocated according to a blind random distribution. Results in 75 patients who completed treatment were judged clinically and on serial chest radiographs by clinicians and radiologists unaware of the treatment schedule. Improvement was significantly greater in those receiving the active drug (57%) than in those on the placebo (17%). Thus, whereas 1 in 6 patients showed spontaneous regression of pulmonary sarcoidosis in 6 months, this trial shows that the number can be improved to 1 in 2 patients if either prednisolone or oxyphenbutazone is used. Both of these anti-inflammatory agents were

equally effective, and improvement was most evident in those treated within two years of the onset of the disease. Active treatment with either of these drugs is recommended if pulmonary sarcoidosis does not resolve spontaneously within a year.

THE USE OF BIFOCALS IN REDUCING ESOPHORIA

LCDR B. L. Newman MSC USN, Opt J Rev Optr 104(18), Sept 15, 1967.

A report based on follow-up refraction-examinations of twenty-nine non-presbyopic patients who were initially prescribed bifocals for continuous wear. Although acknowledged as an approach that is in common use by many refractionists for problems of over-convergence, the writer found substantiation for use of the bifocal procedure in the consistency of progress made by all twenty-nine cases. Also noted was an improvement in mild amblyopia in four of the patients. Data also revealed a decrease in responsiveness to the lens application in direct ratio with an increase in the age of the patient.

DENTAL SECTION

INVESTMENT IN THE FUTURE

D. H. Gehl, J Pros Dent 18(3), Sept 1967.

The author states that the dentist-dental laboratory technician relationship must be one of mutual confidence and understanding. Described is the dentist's responsibility in preparing work authorizations. The author lists requirements that are to be recognized by the dentist *before* a complete denture work authorization is written. Also noted are instructions that should be included on work authorization sheets for:

1. Complete maxillary and mandibular dentures.
2. Single dentures.
3. Immediate dentures.
4. Duplications.
5. Removable partial dentures.
6. Fixed restorations.
7. Repairs, relines, and rebases.

A section of the article, based on consultations with dentists and dental laboratory technicians, is devoted to an explanation of case failures.

Additional points of interest are: first, *more than one* authorization may be necessary for a single prosthesis; second, instructions should be sufficiently detailed so there is no doubt as to what the dentist requires of the laboratory technician; and third, dentists should be familiar with their state codes regarding dental practices and work authorizations.

This information is also the subject of a motion picture entitled, "Investment in the Future," available through the American Dental Association, Bureau of Audiovisual Service.

This article and motion picture may be of particular value to those Naval Dental Officers who utilize the facilities of Area Prosthetic Laboratories.

(Abstracted by: CAPT R. W. Elliott DC USN.)

TREATMENT OF ORAL CANCER

L. L. Benjamin, J Nebraska Dent Assn 42(4):8-9, June 1966.

The dentist plays an important role in both the detection and treatment of oral cancer. Since the

dentist is often the first member of the medical profession to be consulted, it is imperative that he be thoroughly familiar with various diagnostic methods for the early detection of oral malignancies. The dentist should also have an up-to-date knowledge of the latest treatment technics to advise properly and assist his medical colleagues in their treatment of this disease. For instance, if heavy radiation therapy will involve the supporting structures of adjacent teeth, the dentist should recommend the extraction of such teeth to prevent the possible subsequent development of osteoradionecrosis. Finally the dentist is responsible for providing the cancer patient with a prosthesis for the replacement of lost tissue and the restoration of masticatory function destroyed by the surgical removal of a malignant tumor. Modern, comprehensive treatment of oral cancer thus requires a team approach consisting of the disciplines of dentistry, general surgery, oral surgery, radiotherapy, and chemotherapy.

(Abstracted by: George H. Green, From: Oral Res Abs 2(1):35.)

SUBMANDIBULAR SWELLINGS CAUSED BY DENTURES

G. H. Spicer, *Iowa Dent J* 52(3):26-27, June 1966.

Two unusual cases are reported in which excessive submandibular swelling was produced by obstruction of salivary gland ducts by the lingual flange of the lower denture. Although the swellings occurred immediately after dentures were inserted, were painless and not tender, increased in size during eating, and rapidly subsided when the dentures were removed, the condition in both instances was attributed to an allergic response to acrylic denture base material. Eventually the correct diagnosis was established by a careful oral examination that revealed the impingement of salivary gland ducts by the lower dentures. In one patient the ducts were obstructed because their openings were malpositioned; in the other patient an accessory salivary duct was involved. In the differential diagnosis of submandibular swellings, the possibility of salivary gland duct obstruction by a lower denture flange should be considered.

(Abstracted by: George H. Green, From: Oral Res Abs 2(1):43.)

PERSONNEL AND PROFESSIONAL NOTES

NEW CORRESPONDENCE COURSE IN ORAL SURGERY

The Naval Dental School is offering a new correspondence course, *General Oral Surgical Procedures and Exodontia*, NavPers 10729-A. This course and one now under development, *Special Oral Surgical Procedures and Fractures*, replace the course *Oral Surgery*, NavPers 10729, published in 1960.

The subject matter has been divided into two courses to meet more directly the needs of different dental officers, and not to classify procedures according to types of dental practice.

The aim of the new course is to highlight points of clinical importance to both the general practitioner and the specialist. Subjects discussed are principles of surgery and surgical technique; special infections and their surgical relationship; acute and chronic infections of the oral cavity; pharmacotherapeutic

considerations; exodontia; corrective surgery for the prosthodontics patient; diseases of the maxillary sinus; injuries to teeth and the alveolar process; and neurological aspects of dental pain.

The 8-assignment course is based on G. O. Kruger's *Textbook of Oral Surgery*, 2d edition, and is evaluated at 10 points, creditable under current directives governing retirement of Naval Reserve personnel.

All dental officers, Regular and Reserve (active or inactive) of the Armed Forces and dentists of other Federal agencies may apply for enrollment.

Applications should be made by Armed Forces personnel on form NavPers 1550/4 (formerly 992) with appropriate change in the "To" line, and forwarded via official channels to the Commanding Officer (Code E-43), Naval Dental School, National Naval Medical Center, Bethesda, Maryland 20014. Others may apply by letter to the same address.—Naval Dental School, NNMC, Bethesda, Maryland.

TOTAL HEALTH THROUGH PREVENTIVE DENTISTRY

Dental treatment for the civilian is often regarded as an expensive health necessity. Because it is a benefit provided to those in the military service, the cost in lost man-hours of work is often overlooked and not equated in terms of dollars. The number of

man-hours lost as a result of dental treatment in the U.S. Army alone is staggering. It has been estimated that *15,000 men are going to, coming from, or receiving dental treatment daily. The average recruit has 7.75 frank lesions needing restoration and nearly 1 out of 5 new recruits needs dentures. In 1966, it was estimated that 12 million man-hours were required for dental services in the U.S. Army but only 4 million were available.

* U.S. Army Scientific Exhibit, Total Oral Health Through Preventive Practice.

NURSE CORPS SECTION

LEGAL ASPECTS OF NURSING

The Legal Aspects of Nursing Service Administration was discussed by Helen Creighton, R.N., M.A., J.D., Associate Professor of Nursing, University of Southwestern Louisiana during the Director's Conference held recently for Chiefs of Nursing Service at the National Naval Medical Center, Bethesda, Maryland. Some of Dr. Creighton's comments are presented in the following text.

Foundations of Liability

By the Federal Tort Claims Act passed in 1946, the Federal Government created consent liability where claims are established for damage to or loss of property, or for personal injury or death, caused by the negligent or wrongful act or omission of any employee of the government while acting within scope of employment or office, in circumstances in which the United States, if a private person, would be liable to a claimant in accordance with the law of the place in which the act or omission occurred.¹

The phrase "employee of the government" includes members of the military or naval forces of the United States and persons acting for a federal agency in an official capacity.² Nurses serve as officers in the Armed Forces and render service to military personnel and their dependents. Their duties are covered by law and a number of regulations. The Federal Tort Claims Act provides that the federal district courts are to have exclusive jurisdiction of civil suits on claims against the United States for money damages pursuant to its provisions.³

The Federal Tort Claims Act specifically excludes any claim for negligence arising out of the exercise of a discretionary function relating to policy or interpretation, miscarriage or mails or arising out of assessment or collection of custom duty, quarantine, assault and battery, false imprisonment, false arrest,

malicious prosecution, abuse of process, slander, libel, misrepresentation, deceit or interference with contact rights, arising out of operations of the Treasury or combat activities of Military Forces during time of war, arising in a foreign country, in the operation of the T.V.A. or Panama Canal. A person having a claim for these causes or any cause other than negligence as limited by the F.T.C.A. is in the same position as were claimants sustaining negligent injuries prior to the enactment of the F.T.C.A. and as are claimants who has suffered injuries committed by state government employees. They cannot institute legal proceedings in the courts, but they must seek the aid of Congress in the case of a claim against the Federal Government for the enactment of a special law to compensate them for the damages suffered.

Navy Nurse Officers, as is true of any nurse in the federal service, are in a more advantageous position in regard to a claim for professional liability than the nurse in non-government practice for several reasons. There is the distinct possibility that she may not be named co-defendant with the government. Rightly or wrongly navy claimants figure why bother with naming a nurse and/or doctor a defendant when you can sue "Uncle Sam" who is reputedly worth far more than any one of them? If the Navy Nurse is sued, the Department of Justice will defend her without cost. This is of considerable advantage since the services of lawyers are expensive inasmuch as lawyers on the average are the best paid of professional men. Moreover, if a judgment were secured against a Navy Nurse where the United States is a co-defendant, payment almost surely would be sought from the Federal Government. In addition, the F.T.C.A. provides that the acceptance by a claimant of an award or settlement shall con-

stitute a complete release by the claimant of any claim against the United States and against the employee of the government whose act or omission gave rise to the claim.

After the enactment of the F.T.C.A., there have been a number of suits brought against the United States Government by servicemen. The federal courts have made a distinction between service-connected injuries and injuries unrelated to service. Where the injury is service-connected or arises out of or during military duty the serviceman may not sue and recover under the Act.

Some Illustrative Cases

In *Bailey v. De Quevedo*,⁴ a federal trial court held that a soldier did not have a cause of action against two Army physicians at Letterman Army Hospital. The claimant-plaintiff sought damages from the two physicians charging that they had been negligent in leaving a non-dissolving suture in his abdominal cavity. His argument was that while the decision to operate might involve the exercise of discretion, the two doctors had the duty of performing the operation with due care. Therefore, he contended they had no discretion to exercise with respect to the manner of its performance. Since the injury was caused by a non-discretionary act, the soldier argued, the two Army physicians could be held liable if the act was negligent.

The soldier relied on cases in which a distinction was made between discretionary and ministerial functions, but all involved administrative officials of the government. However, the relationship between members of the armed forces is another matter. The court said that a superior in the armed forces, when acting within the scope of his official duties, is immune from a civil action arising out of his performance, without regard to whether the duty is discretionary or ministerial.

The military service does not leave those permanently injured in the line of duty uncompensated but an action under the F.T.C.A. is not a remedy open to them.

Relatives of servicemen if injured in the course of treatment come within the coverage of the F.T.C.A. For example, the parents of a four-year-old boy were allowed to recover under the Act for his death due to the negligence of a Navy corpsman.⁵ This son of a naval officer was born with weak muscles in his right eye and was treated by various Navy doctors. In preparation for an examination for an eye operation, the doctor prescribed a medication one-half of one percent of

atropine sulphate. The Navy corpsman filled the prescription with a 31 percent solution of atropine sulphate. When the mother placed a drop in the child's eye, he died soon thereafter as a result of the negligence of the Navy corpsman.

To my knowledge there are no reported cases in which a Navy Nurse was sued under the F.T.C.A. However, the results of some suits involving physicians and other government employees furnish a clue as to the legal position of the nurse under similar circumstances.

Thus in *Owen v. United States*,⁶ a navy physician's negligence in placing a heated tonometer on a patient's eyeball has resulted in a judgment of \$60,000.00 against the United States government. In that case a 42-year-old retired Marine Corps gunnery sergeant troubled by tears in his right eye and pain behind the eyeball sought relief at a Marine Corps air station where a Navy general practitioner examined him. Tests showed a visual acuity of 20/25 in each eye. The misfortune occurred when the physician, in the course of examination, placed the tonometer tip in an electric sterilizer capable of heating it to 475° F., allowed it to cool in the air for only two minutes before placing the tip on the man's eye. Ten months after the accident, at the time of the trial, he had visual acuity in the injured eye classified as industrial blindness. There was no expectation of improvement. The award covered past medical and drug bills, wages lost and \$3,500.00 for future medical expenses to pay for a recommended corneal transplant when the operation was feasible.

In the corresponding area of nursing, namely the application and execution of nursing procedures and techniques, the nurse and her employer would be liable for negligence to relatives of servicemen. In *Evans v. United States*,⁷ brought under the F.T.C.A., a 13-month-old girl was given an injection of penicillin in her right buttock by an Army nurse at the Patterson Army Hospital after an Army pediatrician determined she was suffering from tonsillitis and pharyngitis. Shortly thereafter, the child developed paralysis in her right leg. It was alleged that the injection injured her sciatic nerve, causing the paralysis. An operation was performed on the child in order to look for scar tissue in and around the sciatic nerve or excise the part of the nerve that was scarred and resuture. No scarring was found and physicians testified that if the antibiotic had damaged the sciatic nerve, scarring of the nerve would definitely be expected. The trial court found the plaintiffs failed to prove that the in-

jection caused the paralysis of the child's right leg. This was affirmed on appeal and this cleared the nurses and doctors of any liability.

In *Trueman v. United States*,⁸ a physician's failure in an army hospital to follow the explicit directions in a drug manufacturer's brochure was ruled as conclusive evidence of negligence. When the physicians injected dye into a child's hand for intravenous urography, the dye infiltrated the subcutaneous tissues, resulting in considerable damage to her hand. In the course of the trial the plaintiff produced the drug manufacturer's brochure, which stated that the dye in the concentration used by the physicians was "not recommended for routine use" but "reserved for difficult cases." In addition, the plaintiff pointed out, the physicians had failed to follow the manufacturer's recommendations to use another drug in case the first showed signs of extravasating.

In the dependent area of nursing functions, the application and execution of legal orders of physicians, the minimum requirements are that the nurse act under the order and direction and/or supervision of a duly licensed physician, that the order be legal and that she comprehend the cause and effect of the order. A nurse was held liable because her professional learning should have made her anticipate injury to a patient when she handed a surgeon during surgery a syringe containing a solution of 4 percent formaldehyde for injection,⁹ and when she failed to wash the patient's eyes as ordered every 20 minutes and this omission resulted in the patient's blindness.¹⁰ Similarly if a Navy Nurse erred in carrying out the orders of a physician in the care of relatives of servicemen, she would render the government liable under the F.T.C.A.

In Alabama, a United States district court ruled that an Air Force psychiatrist was negligent in not informing his successor about violent threats that had been made by an airman. The psychiatrist had briefly hospitalized the airman. Soon afterward he shot and killed his former wife and was sentenced to a 12 year prison term. The appeals court reversed the lower court and ordered the Federal Government to pay damages to the three minor children orphaned by the slaying.

The Court held that the death of the airman's former wife was directly due to his unjustified release from an Air Force hospital after five days and his assignment to duty where he had access to weapons.

After two days in the hospital, the airman was put in the care of a newly arrived physician. The first psychiatrist who was transferred, turned over his notes to his successor but did not inform him of any threats made by the patient against his former wife or an alleged attack upon her with a crowbar.

Similarly nurses are responsible for the accurate recording and reporting of facts, including an evaluation of the whole care of the patient. Many of the statutory definitions specifically include this area within the statute. Failure to chart pertinent facts on relatives of servicemen can assuredly lend to legal difficulties, and even in the case of servicemen themselves, it would seem that third parties injured as a result of failures to properly chart on servicemen have a claim against the government.

In addition there are four other areas of nursing control where a nurse's negligence can result in legal problems. These are as Lesnik and Anderson¹¹ have stated:

1. The supervision of a patient involving the whole management of care, requiring the application of principles based on the biologic, the physical and social sciences.

2. The observation of symptoms and reactions, including symptomatology of physical and mental conditions and needs based on the same principles.

3. The supervision of others, excepting physicians, contributing to the care of the patient.

4. The direction and the education to secure physical and mental care.

The Responsibility of the Navy Chief Nurse

At law everyone is obliged to act as an ordinary, prudent person under the circumstances. As Navy Chief Nurses you are in administration and it is, perhaps, useful to review what is therefore expected of one who is an administrator.

As an administrative chief nurse you are responsible for planning, organizing, appraising and controlling the nurse services to the Navy personnel and their dependents within your area and in accordance with Navy regulations and directives. Planning means you are responsible for determining, setting and preparing purposes, policies and practices of the nursing service. As a Chief Nurse you must aim at the target of the Nursing Service as set forth by the Captain of the Corps and lead and persuade those whom you administer and your self to attain its purposes. In planning, you apply the scientific method to your administrative problems. That is you

determine, define and state your problems clearly; you establish objectives for solving and make a preliminary study of the problem; you determine variables and factors and develop alternative methods of approach; you collect, analyze and classify facts and select a solution based thereon and finally test the solution. For example, you might establish an intensive care or, perhaps, a burn unit at your installation. Planning means the development of the step-by-step administration and the charting of the flow elements of administration. Which of you has not done an administration simplification chart? Planning means carrying on research and development to find new facts not known, but needed to accomplish your administrative assignment. What government chief has not carried out a number of studies? It might have been on the incidence of medication errors or some other topic. Planning means a consideration of the democratic approach to administration, such things as respect for and faith of the individual, as much individual freedom and liberty as the Rules permit and equality of opportunity, rights and privileges. You consider your employees needs and rights, you secure their suggestions and help relative to decisions.

Organization is the development and establishment of relationships between jobs, functions and various departments. You make certain that there is an understanding of what is expected of everyone—particularly through job descriptions and the Administrative Manual. Organization means a determination of levels of authority and the span of management into a good span of control and a proper chain of command. Granted the Navy sets forth these matters for you, their implementation in practice at your station is your concern. Organization, means as the Navy sets forth, delineation of adequate line administrative functions and provision for adequate interrelationships between functions and departments and for growth and flexibility.

Management is the execution of plans; it is getting things done through people. Management starts when delegation is made and accepted. Delegation means investing others with responsibility, authority and accountability. And as you know in the management of men and their human relations, security, reward, effort and tact are important. An important part of management is professional self-development,

examples of which are your own in-service programs in your hospital or this particular week of training. Management of materials and their coordination is also involved. It is the goal of most good managements to accomplish their purpose by the most effective and economical method, with the least effort and thought and with adequate human considerations. Utilization of automation, electronic data processing with computers and human engineering also is a part of management.

Finally there is appraisal and control of the determination, calculation or estimation of the values of the activities of the administrative process. It is a determination, testing, evaluation or measurement of results, their verification and the making of those results reach the levels set.

I have refreshed your recollection of the work of an administrative person—a Navy Chief Nurse—for one reason. The law expects that you will carry out these duties as an ordinary, reasonable, and prudent Chief Nurse.

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5. *Wilscam v. United States*, 16 CCH Neg. Cases 2d 187 (USDC-Hawaii, 1948).
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9. *Halliman v. Prindle*, 62 P. 2d 1075 (Cal. 1935).
10. *Getzhoften v. Sisters of Holy Cross Hosp.*, 88 P. 691 (Utah 1907).
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MEMBER OF "SACRED TWENTY" DIES

Navy nurses of NH, Oakland, California donated fifty dollars to the Medical Department Historical Fund in memory of LTJG Mary H. DuBose, NC USN, Retired. Miss DuBose died in Oakland 11 August 1967 at the age of 91. She was one of the original "Sacred Twenty" of the Navy Nurse Corps. During her 22 years service, she made many contributions to the Navy.

The "Sacred Twenty" is an affectionate term used by the Nurse Corps for the first 20 nurses who entered the Corps following its establishment May 13, 1908. Ester V. Hasson was the first Superintendent, as the Nurse Corps' Chief was then known. Following her appointment the entire "Sacred Twenty" had, by October 1908, reported to the U.S. Navy Hospital, Washington, D.C. for orientation.

PREVENTIVE MEDICINE SECTION

THE NEED FOR THE CONTROL OF THE HOSPITAL ENVIRONMENT

E. D. Mattmiller, J Environ Health 30(1), July-Aug 1967.

It is an accepted fact that our society has progressed from maintenance of "pest houses" of the past to provision of modern hospitals of the present. Credit for this progress largely belongs to those who have devised the means to protect patients from the contaminated hospital environment and the hospital environment from the infected patient. Progress has been slow and painstaking through the years and involved multidisciplinary scientific achievements in the fields of bacteriology, chemistry, physics, pharmacology, epidemiology, public health and others. The discovery and development of antiseptic techniques, the use of isolation facilities, the discovery of chemotherapeutic agents and antibiotics, and the application of sterile techniques are only a few of the factors contributing to our progress.

However, few achievements are gained in any field without the realization of new and additional problems. The more we learn regarding the control of the hospital environment, the more we discover we do not know. Constantly, problems appear requiring new control procedures. The more sophisticated and specialized hospital care becomes, the greater becomes the extent of our problems in controlling the hospital environment. Perhaps the nature of the problems remains essentially the same, but the scope ever increases. The use of transfusions and intravenous therapy resulted in previously unrecognized problems. More recently the advent of inhalation therapy and the general use of air-conditioning in hospitals have focused attention on new dangers to patients. We are now learning to transplant organs from one individual to another, and by engaging in the anomalous practice of immunosuppression, thereby, destroy in some persons the natural defenses we have always relied on as the core of protection against cross infection. These examples—and many more—indicate the need for ever increasing sophistication of techniques for prophylaxis against infection.

Much of the microbiological contamination of importance in transmission of infection in institutions comes directly or indirectly from people, the animate environment. Therefore, it is essential in the prevention and control of this transmission of infectious agents to susceptible individuals by direct person-to-person contact that hospitals exert every effort to

study and control the human factors in this process. There are very complex aspects of the "human factors" in the hospital environment. The education, training, specialization, experience and responsibility of each member of the hospital staff must be considered. These vary from those in the lowest paid employee to those in the most specialized professional staff member. And, of course, the hospital patients and their visitors are most important people in the animate environment. Old methods applied to the problem involved orientation of the individual responsibility of each person as he joined the staff—and depended considerably upon his past background and recognition of his relationship to environmental problems. Responsible for this orientation were the hospital administrator, perhaps the chief-of-staff, and hopefully an active infection control committee. Who among these professionals was especially interested and oriented in recognition and control of health and safety problems in the environment? Who was experienced in recognition of the potential dangers inherent in new employees, facilities, equipment and procedures? Who could develop new methods for necessary preventive measures, both before and after problems were identified, and could develop the "team approach" in applicable situations?

Obviously, patients and their visitors expect hospital personnel to protect them from health and safety dangers in the hospital environment. And I think it is reasonable to assume that each hospital employee expects to do "his job," but also expects that someone else "up the ladder of professionalism" will assist him, should he fall short in his responsibilities, and at the same time will control all other environmental problems and dangers outside his immediate area. So, on to the top—Hospital Administrator—Chief-of-Staff—Infection Control Committee—Who assists these members of the staff? Do they need assistance? Are they sufficiently knowledgeable in the field of environmental health and safety to properly control the infectious and other problems of the environment peculiar to today's modern hospitals? As a physician, I support the view that many hospital administrators and physicians both need and desire the assistance of professionals trained and ex-

perienced in the control of the environment and who can be trained and will work in the specialized field of the hospital environment.

Several workers in the field of hospital infections have stated the opinion that any patient entering a hospital who contracts an infection while there, is the victim of an error in technique. But whose error, what procedure, what equipment or supply? How could the error have been anticipated and prevented? Whose responsibility?

The most fundamental fact regarding the broad problem of infections occurring within hospitals is that clean or healthy tissues become infected because they are exposed to infectious agents at a level of virulence, concentration, or frequency of exposure beyond their resistive powers. Restated in procedural terms, when necessary standards of sanitation and care are practiced in the protection of tissues from contact with infectious organisms, almost no infection will occur. This, then, describes the need.

What are the pathogenic agents most important in the hospital? This question could be answered from several points of view: The agents most commonly encountered; Those agents most commonly pathogenic; Or those agents of greatest virulence or of least susceptibility to ordinary methods of control or treatment. We might say that all pathogenic agents are of extreme importance, as they can all cause disease. Rather than dwell on this subject, I wish only to mention a few of the more commonly recognized—*Staphylococci*, *Streptococci*, *Pneumococci*, *Salmonellae*, *Shigellae*, the *Pseudomonas* organisms, the fungi, and viruses. If you suffer any infection due to any one of these agents, you are one hundred percent affected by this agent, and it is the most important one to you. So all pathogenic agents are important—in identification and control. The quantitative as well as the qualitative level of contamination is important. The quantitative level of contamination with *all* types of microorganisms will provide what has been termed a "hygienic index" for the overall environment of the institution. This is an important fact to be determined and can be learned through the use of known procedures. But, when and by whom?

I have discussed some of the aspects of the animate environment and of the hospital and it is obvious the roles people play in infections—though the interrelationships each person experiences with others and the total environment may be extremely complex and require extensive foresight, evaluation, and control in order to prevent infection, cross infection, or contamination. Likewise, accident pre-

vention requires control of the animate environment and is most important as our hospitals become more and more complex and contain more types of sophisticated equipment. People use objects (facilities) supplies and equipment. This, of course, leads to concern for the inanimate environment and recognition of the need for its control.

The inanimate environment includes air, food, water and objects. And, of course, objects include a great variety of equipment, supplies and components of facilities, such as floors, walls and stairs. Infections have been spread by the air in institutions quite commonly. Literally scores of different types of objects have at one time or another been incriminated in cross infections.

I will present only a few examples of possible sources of infection or cross infection in the inanimate environment by listing several items according to broad groupings.

A. Medical Supplies and Equipment

1. Urinary-tract instruments—e.g. catheters, cystoscopes, and urinals. (But also implicated in genitourinary infections have been rectal thermometers and bedpans. I know of a situation in which bedpans were washed in the sink at a nurses' station in which a great number of other articles used in patient care were washed—without any real definitive sanitation procedures being involved.)
2. Anesthesia apparatus—e.g. face masks, rebreathing bags, and endotracheal tubes.
3. Inhalation therapy equipment.
4. Hypodermic needles.
5. Ophthalmoscopes.
6. Surgical gloves.

B. Antiseptic, Medications and Blood

1. Quaternary—ammonium compounds (it must be remembered that each of these compounds requires its own test to determine its efficiency of action and that antiseptics can become contaminated).

2. Eye drops. (The eyes of patients have become infected through the use of drops contaminated by a dropper which was itself contaminated during use on another patient.)

3. Blood. (Dangers of serum hepatitis resulting from blood transfusions are well known.)

C. Miscellaneous Objects in the Hospital Environment

1. Blankets. (Many hospitals store patient blankets in the bureau or closet drawer of the hospital rooms. They are frequently not laundered after use by every patient, and often are not used by every patient. Consequently, a blanket may become

contaminated, harbor the agent for some time and subsequently serve as a source of infection to another patient.)

2. Water baths.
3. Nursery bottle nipples.
4. Water closets.
5. Sink traps.

6. Faucet aerators. (I know of a hospital in which infections among the infants in the nursery were traced to a faucet aerator which was contaminated and subsequently was the source of microorganisms during the washing of various utensils used in the nursery.)

7. Shoes.

8. Dressing carts. (In some hospitals it has been "standard procedure" to use the same dressing cart while dressing a "clean" case that was used immediately before in the care of a "dirty" case.)

9. Dry mops.

10. Straw brooms.

11. Laundry Chutes. (Hospitals utilizing laundry chutes which open directly into corridors have experienced infections which were spread from one area of the hospital to another via the "common" chute.)

D. Water and Food

Obviously any contaminated food or water can be a source of infection. Sometimes involved—and often unsuspected—have been ice, orange juice, and the bedside carafe. (In the past, procedures in our hospitals included washing the bedside carafes in the sink in the floor diet kitchens. However, no specific sanitation procedures were involved. Studies by our Environmental Health Department revealed the failure of such a procedure to sanitize the carafes between use by different patients. Therefore, we now process the carafes through effective procedures in the hospital dish room.)

E. Airborne Transmission of Infection

1. Surgical suite contamination via faulty ventilation systems. (Cases of contamination of surgical suites, with resultant patient infections, have been reported in which it was determined that contaminated air from hospital rooms was circulated throughout the surgical suite through an improperly designed ventilating system.)

2. Delivered air—e.g. forced air heating and air-conditioning systems. (A hospital in the West experienced a number of infections in the nursery and it required extensive investigation over a prolonged period of time to determine that the cause lay in a cross duct between the laundry chute and the heating ducts supplying the nursery.)

3. Exhalations of personnel. (Clean, nearly sterile air in a hospital room can be proven to quickly become contaminated via the exhalations of personnel when such personnel visit the room for even relatively brief periods.)

I do not believe the medical professor or hospital officials are reticent to accept the assistance of the professional sanitarian in preventing, evaluating and controlling problems in the hospital environment. Rather, I believe physicians and hospital administrators welcome the knowledge that sanitarians have—the education, training and interest to assist in the control of the hospital environment—and will willingly accept offered assistance.

Infections are caused by microorganisms and can be carried through the air by droplets, droplet nuclei, or dust. Levels of microbial contamination can be determined by sampling procedures, for both air and surfaces. Once a problem is identified and evaluated, a solution can be developed.

Examples of the solutions to some of the problems I have mentioned are: (1) Testing and development of a properly fitted filter mask that will prevent and control at least 98 percent of the air contamination of a room by human exhalation when all persons entering the room are properly masked. (2) The term "contaminated area" is applicable to any hospital area, such as corridor, ward or room which is not subject to special supervision. However, studies have proven that a procedure of frequently repeated, intelligently directed and vigorously applied chemical effort in combination with a good detergent-disinfectant can render any surface or area whatever clean or even sterile. If ventilation and type or usage remain the same, bacterial contamination of air in a room can be significantly reduced by daily application of proper cleaning techniques. (3) An efficient air-conditioning system can readily be made to deliver dust free, nearly sterile air into a room under positive pressure. (4) Laundry chutes in hospitals present two problems: that of harboring high concentrations of bacteria which may spread throughout the hospital and that of being a potential fire hazard. However, preventing chutes from opening directly into corridors, providing mechanical exhaust for chutes and receiving rooms, embodying all recommended fire protection principles in the construction of chute systems, bagging all laundry and trash, and developing chute cleaning programs should provide a solution to the problems of hospital laundry chutes.

Suffice to say that from the standpoint of protection against pathogenic agents, the hospital environment includes *everything* and *everybody*, inanimate and animate. In the control of infectious diseases, there is a fundamental principle that the fewer pathogenic organisms available to a susceptible individual, the less is the chance for infection. Therein lies the nature and extent of the need for control of the hospital environment in-so-far as infections are concerned. Learn the cause and find the answer. This is the challenge. The answer requires accurate studies, intensive search for new procedures and techniques, and sound application of knowledge.—Sanitation Sec, Prev Med Div.

POISONS IN YOUR HOME

Federal Safety Council, U.S. Mission Safety 70, 1967.

Many useful items around the house are poisonous; they should be clearly marked.

Many medications are safe "taken as prescribed" but an overdose can be fatal. Read directions before administering and keep these medications out of the reach of children.

Keep all items that have a poisonous effect in one particular cabinet when possible. Keep under lock and key and out of the reach of small children.

A brief list of some of the harmful items that you should be aware of include:

- Camphor Moth Balls
- Naphthalene Moth Balls
- Nail Polish Remover
- Permanent Wave Solution
- Thallium Depilatories
- Hair Dye
- Aspirin
- Candy Laxatives
- Disinfectants
- Barbiturates
- Liniment

All poisons do not have to be swallowed. They may cause skin contamination, eye contamination, chemical burns. They may cause poisoning by inhalation also. And, there is the possibility of food poisoning.

Whenever disposing of containers once holding poisonous materials, either break or bend to prevent later use by adults or children.

Don't use lead-containing paints on toys, cribs, or any other interior surface.

When spraying insecticides, don't hold spray gun near your face, and don't allow anyone else in the room while you are spraying.

Don't let children play with empty containers. There may be just enough chemical left in them to cause trouble.

Don't use a chemical in any other manner or for any other purpose than that stated on the label.

Don't store poisons or potential poisons near foods. Never store poisons in old food containers.

Always read directions and cautions on labels of chemicals.

Keep skin and inhalation exposure to a minimum when using any type chemicals.

Never spray chemicals in the vicinity of food, either open or cooking.

Teach children as early as possible of poisons and potential poisons.

Keep all medicines adequately labeled. Make sure you know contents of the container before administering.

Don't attempt to treat yourself with old prescriptions or patent medicines.

Remember, many items are poisonous only through their misuse and careless handling.

BITES BY CORAL SNAKES: REPORT OF ELEVEN REPRESENTATIVE CASES

H. M. Parrish and M. S. Khan, Amer J Med Sci 253(5):561-568, May 1967.

Eleven representative cases of bites by coral snakes in the United States were reviewed. Four bites occurred in Florida, four in Texas, two in Alabama, and one in Louisiana. Eight bites failed to produce venenation which produced death, the case-fatality rate was 9%. None of the bites by Texas coral snakes (*Micrurus fulvius tenere*) resulted in venenation. All of the bites resulting in moderate and severe venenation were inflicted by Eastern coral snakes (*Micrurus fulvius fulvius*). No bites by Sonoran coral snakes (*Micruroides euryxanthus*) were reported. The recommended treatment for patients having scratch marks but no fang punctures is cleaning the wound with germicidal soap and water, giving tetanus prophylaxis, and observing the patient for 48 hours. Patients having one or more fang punctures should be given 20 ml. of coral snake antivenin intravenously as soon as possible and before the

onset of symptoms of venenation. Larger doses of antivenin may be given if symptoms of venenation appear. Other measures include incision and suction,

antibiotics, tetanus prophylaxis and maintenance of artificial respiration if needed. Narcotics and sedatives are contraindicated.

KNOW YOUR WORLD

Did You Know?

That for 1966, there were 102 cases of paralytic poliomyelitis in the United States?

This is the third lowest figure ever recorded. It is 41 cases more than the 1965 paralytic case total, and 11 more than the 1964 total. This is the first year since 1959 in which the annual total of reported cases exceeds that of the preceding year. Over 75% of the paralytic poliomyelitis cases were in children less than 5 years in age; $\frac{3}{4}$ of the patients had received no prior polio vaccine immunization. There were 7 deaths attributed to poliomyelitis in 1966.

Of the 102 cases, 66 occurred during a poliomyelitis epidemic in southern Texas, this being the largest outbreak in the United States in 3 years. Unimmunized preschool children of lower socioeconomic background were mainly affected.¹

That since 1 July 1967, 177 cases of aseptic meningitis have been reported to the Baltimore City Health Department?

This is an increase of 92 cases over the number reported for the week ending 2 September 1967; the outbreak is continuing. The ages of the patients range from 7 days to 54 years, 71% being in children under 15 years of age. Specimens from 62 patients, gave 20 viral isolations. The predominant enterovirus isolated has been Coxsackie B5 (7 isolations), with 1 isolation of Coxsackie A9, 1 of ECHO9, and 4—ECHO4. Unconfirmed cases are still being reported in Baltimore. Increased prevalence of aseptic meningitis has been noted in the counties surrounding Baltimore City.²

That 1,743 smallpox cases have occurred in Brazil up to 23 September 1967 as compared to 1,223 cases in the same period of 1966?

The State of São Paulo reported 300 cases in the capital city and 701 cases in the interior up to 16 September; an increase of over 551 in the same period of 1966.³

That the State of Illinois became the third state in the nation to adopt a mandatory fluoridation law on 18 July 1967?

This law requires the fluoridation of all municipal water supplies. In Connecticut, a mandatory fluoridation law was effected on 1 January 1967, the first such law in the country. Minnesota adopted a state-wide fluoridation law on 19 May 1967.⁴

That mosquito-borne haemorrhagic (H) fever constitutes an increasingly serious problem in Southeast Asia?

This disease was first recognized in Manila, Republic of the Philippines, in 1954, and has spread westward and has reached eastern India. H-fever is associated with the dengue viruses and is transmitted mainly by the *Aedes aegypti* mosquito.⁵

That 14 cases of diphtheria, including 2 deaths, and 41 diphtheria carriers have been reported from 4 August to 11 October 1967 to the Alabama State Department of Public Health?

The State Laboratory confirmed all reports by isolations of *Corynebacterium diphtheriae*. The 2 deaths occurred in unrelated, unimmunized, Negro females, ages 1 and 7, both of whom developed myocarditis and laryngotracheobronchitis requiring tracheostomy. The remaining 12 cases, 2 were mild in fully immunized children, 10 were mild to moderate, 5 of whom were incompletely immunized and 5 in unimmunized individuals. Two cases lived in the same trailer park of Dallas County. In a culture survey including over 200 trailer park residents, 12 carriers were detected, or 5.6% carrier rate. Six carriers were discovered among 105 first-grade classmates of 1 of the trailer park cases and another was found among 97 fourth-grade classmates. One of the 19 carriers was 1 year old; all others were from 5 to 14 years (mean 8.7 years). One adult case of pharyngeal diphtheria was in an incompletely immunized 19-year-old Negro female. The other case was mild cutaneous diphtheria in a 45-year-old unimmunized Negro farm worker with an infected leg ulcer. Sixty-eight of the 70 members of the all-Negro farm community where the patient lived, were cultured, and 13 carriers were found. Seven of the patient's 10 children had positive oropharyngeal and

nasopharyngeal cultures; 2 of these children had positive cutaneous cultures in addition.

Intensive immunization campaigns are currently being conducted with 21,000 individuals being immunized to date.⁶

That 263 cases of measles have been reported to the NCDC, Atlanta as of 14 Oct 1967?⁷

That a survey has been made of the incidence and distribution of Negri bodies in the brains of 49 patients who died of rabies during a period of 34 years?

Inclusion bodies were found in 71% of the cases, but the structureless inclusions known as lyssa bodies outnumbered the true Negri bodies by more than 4:1. In 15% of the brains, inclusions were the sole evidence of the infection; there was no inflammatory exudate. The commonest site of inclusion was the Purkinje cells of the cerebellum and secondly the hippocampus; but inclusions were found in most sites on occasion. At least 20% of human rabies would be missed if reliance was placed on the identification of Negri bodies for diagnosis.⁸

That currently available data indicate that malaria was introduced by the Spaniards and by the African slaves, whose plasmodia found vectors suited to their transmission and give 1519 as the year in which it was first observed in Mexico?

Genetic and entomological studies confirm the origin of paludism in African negroes, who had acquired immunity through their prolonged exposure to the plasmodia and were able to live in land that the natives had abandoned. Communication of simian malaria by Anopheles may be an added complication of the malaria problem, although such complication represents a limited risk in Mexico.⁹

That in a survey of the incidence of rheumatic fever in Metropolitan Nashville, Tenn., during 1963-

1965, 3 times as many cases of illness were found by the study methods as were reported by the official health agency.

The average annual incidence of rheumatic fever was 12.6 cases per 100,000 population. There was no significant difference in the rate for any of the 3 years, but the seasonal incidence was highest in the winter and spring months.

The incidence of rheumatic fever was nearly twice as high among nonwhite as among white persons. No significant differences in incidence were noted between the sexes; age-specific rates were highest in the age group 10-14 years.

Four persons had both initial attacks and recurrences. Among all cases, 79.7% had initial attacks and 18.3% had recurrences. Patients with initial attacks were, on the average, 6 years younger than those with recurrent attacks.

The Jones criteria for the diagnosis of rheumatic fever were satisfied by 70% of the cases. Clinical evidence of carditis was present in more than 40% of initial and recurrent attacks. It was present in 37% of those patients under age 20 and in 43% of those age 20 and over.

Despite the availability of effective prophylaxis, recurrent attacks of rheumatic fever continued to occur.¹⁰

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EDITOR'S SECTION

GARY P. WRATTEN SURGICAL SYMPOSIUM

A symposium on current surgical practices will be held at Walter Reed Army Medical Center, on Monday, Tuesday and Wednesday, 1, 2 and 3 April 1968. The Surgeon General of the Army has given his strong support to this seminar. An outstanding

program has been arranged which will include recent advances in the fields of general surgery and the surgical specialties, new advances in clinical research and new procedures and techniques. Civilian surgeons of national prominence are included on the program.

Medical officers are urged to make application for presentation of papers, to be limited to 15 min-

utes with few exceptions. Case reports will also be accepted, limited to 5 minutes. Submit the title of your paper together with an abstract of not more than 50 words and time desired for presentation, to LTCOL Joseph H. Baugh, MC USA, Chief, General Surgery Service, Walter Reed General Hospital, Walter Reed Army Medical Center, Washington, D.C. 20012, (with a copy to BuMed) not later than 1 January 1968.

The symposium is open to surgeons of the Army, Air Force, Navy, Veterans Administration, Public Health Service, and also civilians, particularly from Reserve Corps and National Guard. All are invited and encouraged to attend. Social events will include the wives. There will be a "get acquainted" cocktail-buffet on Sunday evening, 31 March, and a cocktail-banquet on Tuesday evening, 2 April, at the Walter Reed Army Medical Center Officers' Club.

CHU LAI MEDICAL SOCIETY SOUTH VIETNAM

On 3 August 1967, an executive committee was appointed to lay the ground work for the Chu Lai Medical Society, South Vietnam. This was composed of:

CDR Frank M. Roberts, MC USN
1st Hospital Company Chairman

LT Joseph J. LaHood, MC USNR
1st Hospital Company

LT A. E. Kirk, MC USNR
Marine Air Group 13

CAPT N. C. Reynolds, MC USA
2nd Surgical Hospital

This first meeting (3 August) was held at the Officers' Club of 1st Hospital Company, Chu Lai, South Vietnam.

On 17 August 1967, permanent officers were elected:

President:

CDR J. S. Maughon, MC USN
1st Hospital Company

Vice-President:

LCDR R. M. O'Brien, MC USN
1st Hospital Company

Secretary:

CAPT J. L. Beck, MC USA
2nd Surgical Hospital

Treasurer:

LT W. A. Stocker, MC USN
1st Hospital Company

The purpose of the society was clearly delineated "to continue to disseminate information about our current experiences and practice and to periodically review Medical Subjects." Weekly meetings in the Officers' Club at 1st Hospital Company were established. Sixty charter memberships were issued, the total membership at present being seventy-one. Prominent medical personnel who have aided and encouraged the establishment of this Society, yet outside the Chu Lai area, will be issued Honorary Memberships.—President, Chu Lai Medical Society, South Vietnam.

A NOTE ON STP

STP, a drug claimed to be an hallucinogen, is a substance chemically identified as 4-methyl-2,5-dimethoxyalphanemethylphenylethylamine, a congener of mescaline. The Food and Drug Administration reports that this substance has been found in tablets obtained in different parts of the United States.

STP is an untested drug about which little information is available. However, several persons who used STP suffered severe reactions, according to reports to the FDA from a number of hospitals. In taking a history of drug usage, an effort should be made to distinguish between LSD and STP intoxication, because chlorpromazine (Thorazine—SK&F), which is useful in counteracting the effects of LSD, is contraindicated in STP intoxication; it worsens the agitation and may cause death from respiratory arrest.—The Medical Letter 9(19), Issue 227, Sept 22, 1967.

AWARDS AND HONORS

Silver Star

Churchill, Joe V., HMC USN
Sullivan, Caleb J., HN USN

Bronze Star

Bayer, Jon "D", HM3 USN
Cline, Robert E., HMC USN
Lingle, Lyle R., HM3 USN
Obey, Charles D., HN USN
Redmon, Douglas R., HM3 USN
Reed, John T., HM3 USN

Legion of Merit

Osborne, David P., CAPT MC USN

Navy Commendation Medal

Barbarin, Lloyd J., HM1 USN
Campbell, Donald F., HM3 USN
Coucher, Willie E., HM1 USN
Duffey, William S., CDR MSC USN
Gotwalt, Gary H., HMC USN
Hebdon, Floyd E., HM2 USN
Lassiter, Dennis E., HMC USN
Lathrop Robert N., HN USN
Nelson, Russell C., Jr., HM1 USN
Nixon, Robert B., HM2 USN

Peterson, Terry R., HN USN
Ruffin, Robert S., LCDR MSC USN
Skelly, Robert S., LT MSC USN
Smith James L., LTJG MSC USN

Navy Commendation for Achievement

Ingersoll, James E., HM1 USN

Army Commendation Medal

Metcalf, Lawrence P., LT MSC USN

Navy and Marine Corps Medal

McIsaac, Neil E., HM1 USN

HEART FAILURE

The failing heart has no deficiency of high-energy compounds needed to power its contractions, but its ability to tap these energy sources may be impaired in congestive failure, scientists of the National Heart Institute reported.

The immediate energy source of heart muscle is adenosine triphosphate (ATP). Large amounts of chemical energy, stored in the chemical bonds linking the phosphate groups of the ATP molecule, are released when these bonds are broken. This energy is made available as needed by enzymes called ATPases, which remove one of the phosphate groups from ATP, then harness the liberated energy to perform useful work. The ATPase of heart muscle is found in myosin, which, with actin, constitute the contractile proteins of heart muscle fibers (myofibrils).

Drs. Brian M. Chandler, James F. Spann, Jr., Edmund E. Sonnenblick, and Peter E. Pool of the NHI Cardiology Branch, have demonstrated that the ATPase activity is depressed in myofibrils from failing hearts. Their findings, reported at the 40th Scientific Session of the American Heart Association, suggest that reduced ATPase activity may be a significant factor in the depressed contractility that limits the pumping effectiveness of the failing heart and renders it incapable of keeping pace with the circulatory needs of the body. Their findings may provide valuable clues to the basic defect, possibly existing at the molecular level, that underlies the development of congestive heart failure.

The English scientist, A. V. Hill first proposed that the speed at which the heart muscle contracts (contractility) is related to the rate at which ATPase directs the energy release from ATP. This hypothesis was partially verified by Barany of Hungary who correlated the ATPase activity with

the velocity of contraction by examining a variety of different types of skeletal muscles—from the fast muscles of the frog to the slow muscles of the sloth. He studied the ATPase of actomyosin, the protein which makes the heart contract. Barany found that the muscle's intrinsic speed of contraction is in proportion to the rate of ATPase activity.

Right ventricular failure was experimentally induced in cats by constricting the pulmonary artery. This greatly increased the resistance against which the right ventricle had to work in pumping blood to the lungs. Under this heavy strain, the right ventricle became greatly enlarged, then lapsed into failure.

Samples of muscle tissue were taken from the left and right ventricles of both groups of animals. The velocity of contraction of the muscle fibers was measured in a myograph. As expected, the velocity of contraction of fibers from failing right ventricles was substantially slower than that of the fibers from normal right ventricles.

The ATPase activity of muscle fibers from failing right ventricles was 39% lower than that of fibers from normal right ventricles. This depression of ATPase activity was directly proportional to the decreased contractility observed earlier with the myograph. ATPase activity was slightly depressed in muscle samples obtained from the left ventricles in hearts with right ventricular failure, and was normal in normal hearts.

The study results provide further support for Hill's hypothesis that heart muscle contractility is directly related to its ATPase activity and confirm and extend the earlier work of Barany.

Although the cause of the depression in ATPase was not determined, the investigators hypothesized that there may be some relation between depressed ATPase and congestive heart failure.—NHI, Bethesda, Md.

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